

should have been recorded in simple terms, that is, without the adventitious aid of a special nomenclature, which merely obscures their significance.

A more important section is that devoted to a careful study of the supposed total hydrolysis of cellulose to hexose groups, and the implied problem of fundamental constitutional import. The author rightly recognises that the experimental verifications of the view that "cellulose is a polyhexose anhydride," are wholly defective; indeed, with progress in investigation the actual yields of sugars or their immediate derivatives obtained from (cotton) cellulose are extremely variable and generally much below the statements of the earlier observers, Braconnot, Béchamp, Flechsig.

The later investigations of Ost and Wilkening indicate that the hydrolysis is complicated by the formation of acids of low molecular weight, and their results with the author's present contribution undermine the plausible assumption that cellulose is a close analogue of starch.

In his study of the hydrolysis of the normal cellulose, the author has taken as his starting point the well-known intermediate products obtainable as colloidal hydrates, thus Guignet's "Cellulose Colloide," Flechsig's typical "Amyloid," "Parchmentised Cellulose," and Ekström's so-called "Acid Cellulose." These products, tested in relation to Fehling's solution, and the particular scheme of hydrolysis previously described, gave extremely variable numbers, thus for the "Korr: Hydrolysierzahl" 7.3, 26.7, 17.6, 30.4, for the products in the above-named order. Following the section devoted to a careful study of these proximate products, is the complementary section on "Die Abbauendprodukte der Baumwollecellulose und des Sulfatzellstoffs."

From the preface (Schwalbe) we abstract the important result of these laborious observations, which is that the author obtained from cotton cellulose only 40 to 50 per cent. of its weight of the hexose (dextrose), either as such, or calculated from the yield of ozazole, and from sulphite celluloses less than one-half this yield.

This work we commend to the careful study of those who take a special interest in cellulose chemistry. In this case also we can commend the author's minutely detailed record of experimental conditions, which are quite essential. The only criticism we offer is that the work would have been more fruitful if spread over a smaller range of the intermediate products.

The differentiation of these is relatively unimportant. The concentration of the investigation upon the endeavour to account in any one case for the 100 parts of cellulose taken into work, in terms of the final products of hydrolysis, would have furnished a much more valuable and positive contribution to the fundamental problem.

As a further suggestion, the resolution of the acetate or "Acetolysis" of cellulose appears to be more promising of attaining to ultimate hydrolysis, the elimination of OH groups keeping the breakdown of the complex on simpler lines of cleavage (comp. W. Schliemann, *Annalen*, 378, 366, 1911).

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Much work is being done in this direction, and we may expect before long to integrate the contributions from the two directions of experimental study into comprehensive schematic constitutional formulæ for the typical celluloses. We may anticipate from this a new light on "organic" chemistry in the full sense of the term.

#### OUR BOOK SHELF.

*The Law of Sex Determination and its Practical Application.* By Laura A. Calhoun (Mrs. E. E. Calhoun). Pp. 254. (New York: The Eugenics Publishing Co., 1910.) Price 1.50 dollars net.

THE theory suggested in this book is that "the sex of the embryo in man and the higher animals is determined in the ovary from which the ovum in question is developed. In the normal female the ovary of the right side yields ova which on fertilisation develop as males, and the ovary of the left side yields ova which are potentially female." "The writer is not in a position to furnish absolute verification, through methods of anatomy or physiology, of her theory. She has no laboratories nor methods of precision by which her theory can be directly tested. But she is convinced of its truth from her own extensive experience in its practical application for a period of thirty years." She has instructed her friends, and "the results have always verified the law, which during thirty years of observation and testing have never failed."

We shall not give away the ingenuous author's practical recipe, but the general theory is that the right ovary is responsible for the males. This will be good news for those who believe that men are always in the right. "In normal mothers the right ovary always produces ova that, when fertilised, develop as boys. The left ovary always produces ova that, when fertilised, develop as girls. And the mother determines the sex of her child when she consciously or unconsciously directs the fertilising spermatozoa to her right or left ovary." The evidence in support of the theory consists of references to a relatively small number of cases where obedience to the author's practical suggestions was followed by the appearance of a girl or a boy as desired.

A theory similar to the above was brought forward in 1909 by Rumley Dawson, and in dealing with either of them we are met by the difficulty of applying precise experimental tests in the case of man. The experiments of Doncaster and Marshall, reported in the *Journal of Genetics*, November, 1910, show that "in the rat it is not true that ova determining one sex are produced from one ovary, and those determining the opposite sex from the other, for each rat, with one ovary completely removed, produced young of both sexes. This does not, of course, prove that the 'right and left ovary hypothesis' is not true for man, but its definite disproof for another mammal detracts from its probability." It may also be recalled that birds have only one ovary.

The book before us is in great part made up of quotations, mostly from sound authorities, such as E. B. Wilson, W. E. Castle, L. Cuénot, and T. H. Morgan. It is a well-intentioned book, but it does not contribute much to the difficult problem discussed.

*New Zealand Plants and their Story.* By Dr. L. Cockayne. Pp. viii+190. (Wellington: John Mackay, 1910.)

For some years past it has been Dr. Cockayne's endeavour to arouse amongst the settlers in the Dominion a better knowledge and appreciation of their

exceptionally interesting native flora, and with this object he has, in addition to his various official reports, contributed from time to time popular botanical articles to different local journals. The material for several of these articles has been worked up into the more homogeneous ecological account now published by the Government of New Zealand for the benefit of private individuals and for instruction in schools.

The wealth of botanical treasures is truly great. Thus the forests comprise mixed forests—in which the ancient kauri pine, *Agathis australis* and *Beilschmiedia tarairi*, are conspicuous—and pure forests of *Podocarpus dacrydioides* and *Nothofagus*. The mixed forests are the homes of abundant lianes—to mention only species of *Metrosideros*, the liliaceous *Rhizophyllum scandens* and *Lygodium reticulatum*—many tree ferns and epiphytes. No less interesting are the shrubs, chief amongst which are the subalpine species of *Olearia*, *Cassinia*, and *Veronica*, while the manuka, *Leptospermum scoparium*, and allied species play an important part in the physiognomy of the native heaths. Then again the alpine meadows are rich in floral gems, notably species of *Euphrasia*, *Ourisia*, *Celmisia*, and *Ranunculus*. Amongst plant curiosities the vegetable sheep, *Raoulia eximia*, is the most unique.

In addition to the ecology, chapters are devoted to an account of the early explorers, naturalised plants, the stories of four common plants—New Zealand flax, manuka, Fuchsia, and *Cordyline australis*—and plant cultivation. The few examples noted above will serve to indicate how rich and unique is the New Zealand flora; Dr. Cockayne's treatment is fully equal to his subject, and one could only wish that he had much more space to enter into greater detail. The numerous illustrations, although imperfectly reproduced, contribute a better realisation of the plant scenery.

*De la Méthode dans les Sciences. Deuxième Série.* by B. Baillaud, L. Bertrand, L. Blaringhem, E. Borel, G. Lanson, L. March, A. Meillet, J. Perrin, S. Reinach, and R. Zeiller. Pp. iii+365. (Paris: Félix Alcan, 1911.) Price 3.50 francs.

THE first series of studies in the methods of science by distinguished French writers was reviewed in NATURE on September 23, 1909 (vol. Ixxi., p. 361). The present volume has the same general characteristics, though the point of view is more technical and less philosophical. The following branches of science, which were not dealt with in the former volume, receive attention—astronomy, physical chemistry, geology, botany and palaeobotany, archaeology, literary history, linguistics, and statistics. The essays should assist in providing the reader with a broad general view of scientific methods, and help to correct the narrowness which may result from a too exclusive absorption in a restricted field of scientific investigation.

*Essays in Historical Chemistry.* By Sir Edward Thorpe, C.B., F.R.S. Third edition. Pp. xii+601. (London: Macmillan and Co., Ltd., 1911.) Price 12s. net.

PREVIOUS editions of this valuable work have been reviewed in these columns at some length, the first in our issue for April 12, 1894 (vol. xlii., p. 551), and the second in that of August 14, 1902 (vol. lxvi., p. 365). The present edition differs from the last in including the memorial lecture on Julius Thomsen delivered to the Fellows of the Chemical Society on February 17, 1910. We also notice an addendum to the life of Prof. Stanislao Cannizzaro, who died at Rome on May 10, 1910.

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*School Planning at Home and Abroad.* By William H. Webb. Pp. 42. (London: The Sanitary Publishing Co., Ltd., 1911.) Price 1s. net.

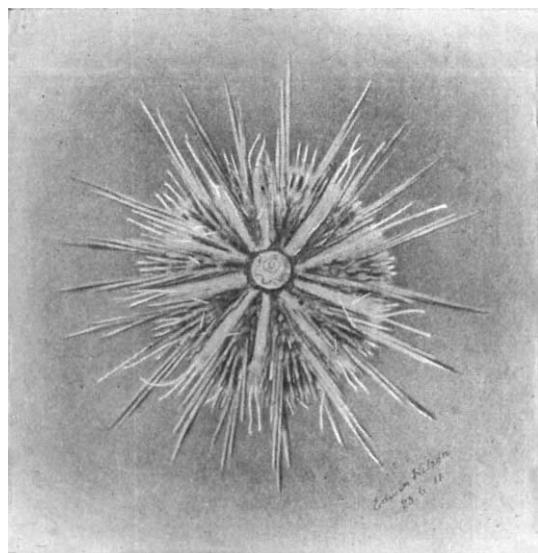
At the annual congress of the Royal Sanitary Institute, held in September last at Brighton, Mr. Webb read a paper on "Large Public Elementary Schools in Town Districts." The paper is here published in book form, and illustrated by plans and other diagrams. Mr. Webb's inquiries respecting the characteristics of school buildings in various parts of Europe and America enable him to provide those responsible for the design of new schools with many useful hints.

#### LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

#### The Rearing of Sea Urchins.

I ENCLOSE a photograph which may interest your readers. It is one of a water-colour painting of a sea-urchin, magnified 4 diameters, which has been reared in my laboratory by Dr. Cresswell Shearer. It is a hybrid, a cross between *Echinus millearis* (male) and *E. esculentus* (female), both obtained from the Plymouth Marine Laboratory. The cross was effected in the early part of March last. It was kept in thoroughly aerated seawater for



some time, but has for the last three months been living in a bell-jar with part of an old crock covered by worm tubes, without the water being aerated in any way. It generally shelters in the day time under the crock. When disturbed, it moves actively away from the light, and still appears thoroughly healthy. It shows what may be done in an inland laboratory with simple appliances.

J. STANLEY GARDINER.  
Zoological Laboratory, Cambridge, July 10.

#### Absorption Markings in "K" Spectroheliograms.

MR. EVERSHED's remarks in NATURE of May 11 cause me to think that possibly an essential difference in the method employed for reproducing original negatives for journalistic purposes might go far towards explaining the difference of definition and richness of detail in M. Deslandres' plates. Anyhow, we are now assured that the Kodaikanal negatives show in the main the same structures as those taken at Meudon. Yet if the former admittedly permit such a great amount of  $K_2$  radiation to